

Influence of Media on Cognitive Development

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Much speculation, little research and theory

- The effects of media on cognitive development has been largely the domain of popular writers since the 1970s e.g.:
 - Marie Winn, *The Plug-In Drug*
 - Jerry Mander, *Four Arguments for the Elimination of Television*
 - Jane Healy, *Why Our Children Can't Think*

Claims

- Television shortens attention spans
- Television causes ADHD (Hartmann)
- Television induces mental passivity
- Television reduces ability to engage in narrative inference
- Television reduces creativity
- Television reduces language ability
- Television interferes with reading
 - Much negative focus on *Sesame Street*

Anecdote and appeal to authority is characteristic

- Halpern, undocumented clinical experience 2-year-old SS viewers are “wound-up little robots”.
- Moody, quotes reading expert that TV trains wrong kind of eye movements.
- Healy, claim that SS creates inattention to language because it teaches phonics and has attractive video, quotes teachers and other whole language experts.

But the issue is real

- If early experience matters to cognitive development, then media use could have an effect, especially given large amount of time. Media engage attention and require more or less complex forms of perceptual, cognitive, and emotional processing.
- For example, adult processing of video action sequences engaged 17 distinct brain areas as compared to processing of random shot sequences Anderson et al. (2006).

There is little theory

- Theories of brain and cognitive development provide little direct guidance.
- Brain
 - Increases in mass, connectivity develops, then changes (pruning).
 - Experience can influence connectivity and function. This provides no predictions about impact of media other than the possibility of influence on brain.

Cognitive Development Theory

- Theories of cognitive development have different emphases but general agreement in importance of
 - Maturation
 - Child's active engagement in specific activities
 - Role of parents and schools in teaching skills and strategies, scaffolding
 - Observational learning and imitation

Rarely any discussion of or predictions about role of media.

Content-Based Theory from Media Research

- The notion that viewers actively learn from media and that this learning influences behavior (Anderson & Lorch, 1983; Huston & Wright, 1983) •
- This leads to predictions that positive and negative effects stem mostly from content.

Medium-Based Theory from Media Research

- Time displacement predicts negative effects if valuable activities are displaced_(Williams, 1986) •
- Somewhat nebulous form-based theories based on assumed passive nature of cognitive processing, especially of TV. Related to rapid pacing_(Singer, 1980) •

The Research: Attention

- Claim: TV reduces attention span and causes ADHD; alternatively, attention skills can be taught by media.

Small Experiments

- There are several small-scale experiments, only one dealing with pacing.
 - TV can be used to teach attentional skills, e.g., Crawley et al., 1999; Salomon (1979).
 - Rapidly paced TV has no short-term effects on play, perseverance, impulsivity Anderson et al. (1977).
 - Israeli 2nd-graders were less perseverant in a tedious task after watching SS Salomon (1979).

Larger Experiments

- Reducing TV viewing in 6-year-olds reduced impulsivity Gadberry (1980)
- Watching *Mister Rogers* increased persistence and tolerance of delay. Watching *Batman* reduced these

Friedrich & Stein (1973).

Summary of Experiments

- Effects of TV on attention vary with type of content as well as amount of viewing: educational content can enhance attentional skills, violence can increase impulsivity.

Correlational studies

- Correlational studies provide mixed findings.
 - Several small studies find violence viewing related to impulsivity, inattention in school e.g., Anderson & McGuire, (1978); Singer et al. (1984)
 - One large study finds toddler and preschool TV viewing predicts ADD symptoms Christakis et al. (2004).
 - Two large studies find no relationship Obel et al. (2004); Stevens & Mulrow (2006)

An Effect of TV on Attention is Possible

- May be content-related, time-displacement, or effect of background TV; still no evidence that it is pacing-related
- Effects may be positive as well as negative
- Effects may be due to very early exposure
- Studies are far from conclusive
- Little analysis of gender, SES, or context variables.

Language and Reading

- Theory unclear.
 - Healy claim that attractive visuals teach inattention to language.
 - Williams hypothesis that TV could displace reading time.
 - Educational TV assumption that TV can teach vocabulary, letter recognition, and some aspects of reading (SS, *Between the Lions*).

Few experiments, many correlational studies

- Taken together the evidence does not lead to simple conclusions.
 - During infancy, associations with language depend on program watched Linebarger (2005).
 - Watching SS predicts vocabulary increase Rice et al. (1990), more book reading in high school, better grades in English Anderson et al. (2001).
 - Watching *BTL* helps children who are having moderate difficulty with reading Linebarger (2003).
 - General TV viewing complexly related to reading, not related to vocabulary (many studies).
 - General TV viewing during 2nd grade may interfere with reading acquisition Williams (1986).
 - General TV viewing may have negative impact before age 3 and positive thereafter Zimmerman & Christakis (2005).

There are other effects as well

- *Sesame Street* viewing predicts greater high school grades Anderson et al. (2001).
- TV and interactive media can influence spatial skills Greenfield & Subramayan; Rovet (1983)
- Speculations that Flynn effect stems from media Neisser
- TV may reduce creativity Valkenburg & Van der Voort (1994)

We Know a Little but not Much

- Content matters: TV designed to enhance cognitive development, does so.
- Other kinds of TV or too much TV may interfere with cognitive development.
- Effects may depend on age and context.
- There is little well-developed theory and little research in many areas of cognitive development.
- There is little research on interactive media.

More Research is Needed

- Most immediately, we need to know the effects of very early exposure to media
- We need to know more about cognitive skill activation and brain activation during media use
- We need to know more about impact of media multi-tasking
- We need prospective longitudinal studies
- We need intervention studies
- We need studies of media impact on children at educational risk